

Department of Instrumentation & Control Engineering

Technician

Stage-I (Screening Test)

Stage-I (Screening Test): A screening test shall be conducted in the first phase in form of multiple choice written test. Written test shall be of **90 minutes'** duration comprising of **75 questions**. Each **correct answer will be awarded One [1] mark** and for each **wrong answer One-fourth [1/4] mark shall be deducted**. Screening test shall consist of questions on **General English**(Tenses, Active and Passive, Direct and Indirect speech, Punctuation, Correction of sentences, One word substitutes, Modals, Articles, Clauses, Synonyms, Antonyms, Idioms and Phrases); **Numerical Aptitude Arithmetic**(Simplification of Fractions, Simple and Compound Interest, Profit and Loss, Percentage, Averages, Number System, Time and Work, Problems on Trains, Calendar, Area, Problems on Numbers, Square root, Cube root, Time and Distance and Other basic Arithmetic related matters); **Reasoning and Data Interpretation** (Number Series Compilation, Missing Number finding, Pattern series, Direction Sense Test, Series Compilations, Classification, Missing Character finding, odd man out, Blood relations, Analogy, Coding and Decoding, Letter and Symbol Series, Verbal reasoning, Statement and Conclusions, Letter and Symbol Series, Logical Problems, Arithmetic reasoning, Logical Sequence of words, Pie Chart and Bar Chart).

Eligible candidates **Ten Times** of the positions in each category will be screened for the Stage-II subject to the fulfillment of all educational qualification etc. as per the Recruitment Rules-2019.

Stage-II (Skill test)

Stage-II (Skill Test): The skill test will be of qualifying nature.

Laboratory Experiments etc. as per nature of the post shall be conducted in the respective laboratories/field. Minimum qualifying marks in the skill test will be [UR:30%; EWS:27%; OBC:27%; SC:20%; ST:20%; PwD:15%].

The candidates, who will qualify the skill test, will be called for the final written test. The Candidates appearing in the written test must ensure their eligibility for the particular category

of post. The documents in support of their eligibility shall be verified before the Final test. If any candidate will not have requisite qualification etc. as per the post for which he is appearing will not be allowed to sit in the final test (Stage-III).

Stage-III (Final test)

Stage-III (Final Test): Final written test shall be of 2 hours duration comprising of 100 multiple choice questions.

Each **correct answer will be awarded One [1] mark** and for each **wrong answer One-fourth [1/4] mark shall be deducted**. Only those who are screened in after the Screening test [Stage –I] and qualify the Skill Test [Stage-II] will be allowed to appear in the Final Test [Stage III]. The minimum passing marks in Final test will be [UR:30%; EWS:27%; OBC:27%; SC;20%; ST:20%; PwD:15%].

The final merit list shall be drawn on the basis of the stage-III written test.

SYLLABUS FOR SKILL TEST AND FINAL WRITTEN TEST IS AS PER ANNEXURE-IV.

Department of Instrumentation & Control Engineering

Syllabus of Skill Test (Technician)

1. To verify Thevenin's Theorem and Norton Theorem for a given network
2. To determine resonance frequency & Q factor in RLC circuits
3. To measure amplitude, frequency and phase angle by Cathode Ray Oscilloscope (CRO).
4. To measure the unknown Resistance by *Wheatstone's bridge (use null deflection method.)*
5. To measure unknown capacitance by Wien bridge
6. To perform open circuit test on a single phase transformer
7. To perform short circuit test on a single phase transformer
8. To determine the speed-Torque characteristics of a AC servo motor
9. To determine the speed-Torque characteristics of a DC servo motor
10. To Perform addition of two, 8-Bit numbers using assembly language code for 8085 microprocessor kit.
11. To Perform Hexadecimal additions of two numbers using assembly language code for 8085 microprocessor kit.
12. To convert temperature from °Celsius to °Fahrenheit and Kelvin scale.
13. To obtain Lissajous pattern for two different sinusoidal signals.
14. To plot the Characteristics of I/P converter and Pneumatic control valve in Pressure process station.
15. To determine PH, Conductivity and Turbidity of unknown Solution
16. To determine the viscosity of given sample

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Syllabus for Final written test (Technician)

Computer awareness:

Basic knowledge of Computer Applications, viz; MS Word, MS Excel, Power Point etc. Internet, MS-DOS, Computer Generation & Development, UNIX, Windows, Lotus, Smart Suite, Data Entry, Software knowledge, Networking Platforms, applications of computers in Instrumentation/Electrical Engineering

Unit and Measurement:

Definition, Classification, Fundamental and derived units, systems of units: FPS, CGS, MKS, Units of physical quantities, symbols, Conversion factors, Measurements of mechanical quantities, electrical quantities.

Mass, Weight and Density

Definition, Comparison between mass and weight, Comparison between density and relative density/specific gravity, Volume of different geometries (Cube, Cylinder, Cone Sphere etc.), Related Problems

Work, Power and Energy

Definition, Work and its units, Measurements of Work, Work done on bodies moving on horizontal and inclined planes (Consider frictional forces also) Concept of Power and its units, Calculation of Power (Simple cases), Concept of Kinetic energy and potential energy, Expressions for P.E and K.E, Principle of Conversion of Energy.

Speed and Velocity

Definition of speed, velocity, and their comparison, Scalar and Vector quantity, Average Velocity, Acceleration and Retardation, Equations of Motion, Circular Motion: Relation between circular and linear motion.

Heat and Temperature

Definition, Specific heat and thermal capacity, Types of heat: Sensible Heat, Latent Heat, Difference between heat and temperature, Different temperature scales and conversions, Temperature measuring instruments: RTD, Thermistors, Thermometer, Pyrometer, and Thermocouple.

Basic Electrical and Instrumentation

DC and AC currents/Voltage, Resistance and their combination circuit, Color coding of Resistance, Wiring Diagram of domestic and electric circuit, self-inductance (L), Mutual inductance (M), Inductors, Types of capacitor, charge, and energy stored in capacitors, Electrical Terms and Units, Ohm's Law, Kirchhoff's law, relationships between Current, voltage, resistance, and Power, resistance connections, Series and Parallel connections, Insulators, Properties and Classifications, Conductors: Properties and Classifications, Semiconductors: properties and classifications, Electrical Power, Introduction

of AC and DC generators, Faraday's Law, Lenz's Law, Fleming's left hand and right hand rules, basic sensors and transducers, Troubleshooting and installation.

Basic Electronics:

Semiconductors, Diode, PN and NP diode, Zener diode, Voltage regulators, BJT, Logic Gate, Analog and digital multimeter, CRO.

Occupational Safety and Health

Safety and Health, Introduction and importance of occupational safety and Health, Occupational Hazards: Basic Hazards, Chemical Hazards, Vibration Hazards, Mechanical Hazards, Electrical Hazards, Thermal Hazards, Occupational Health, Accident and Safety; First Aid: Care of injured and Sick at the work places, Basic provision: Idea of basic provision of safety, health, welfare under legislation of India.

Environment Education:

Ecosystem: Introduction to Environment, Ecosystem and factors causing imbalance, Pollution and Pollutants including Liquid, gaseous and hazardous waste, Energy Conservation: Conservation of Energy, Re-use and re-cycle, Global Warming: Climate change and Ozone layer depletion, Ground water, Hydrological cycle, ground and surface water, conservation and harvesting of water, Environment: Right attitude towards environment, Maintenance of in-house environment.

IT Literacy

Computer: Introduction, Computer and its applications, Hardware and peripherals, Switching

on and Shutting down of computers, WINDOWS, Basic of OS, WINDOWS, Create, copy, move and delete files and folders, Use of External Memory, MS Office, MS-Excel, Internet surfing and its use, Information security, Antivirus tools, Awareness of IT Act, Types of Cyber-crime.